

SEQUENCE LISTING

(1) GENERAL INFORMATION:

- (i) APPLICANT: Reyes, Gregory R
Yarbough, Patrice O
Bradley, Daniel W
Krawczynski, Krzysztof Z
Tam, Albert
Fry, Kirk E
- (ii) TITLE OF INVENTION: DNA Sequences of Enterically Transmitted
Non-A/Non-B Hepatitis Viral Agent
- (iii) NUMBER OF SEQUENCES: 20
- (iv) CORRESPONDENCE ADDRESS:
 - (A) ADDRESSEE: Dehlinger & Associates
 - (B) STREET: 350 Cambridge Avenue, Suite 250
 - (C) CITY: Palo Alto
 - (D) STATE: CA
 - (E) COUNTRY: USA
 - (F) ZIP: 94306
- (v) COMPUTER READABLE FORM:
 - (A) MEDIUM TYPE: Floppy disk
 - (B) COMPUTER: IBM PC compatible
 - (C) OPERATING SYSTEM: PC-DOS/MS-DOS
 - (D) SOFTWARE: PatentIn Release #1.0, Version #1.25
- (vi) CURRENT APPLICATION DATA:
 - (A) APPLICATION NUMBER: US 09/128,275
 - (B) FILING DATE: 03-AUG-1998
- (vii) PRIOR APPLICATION DATA:
 - (A) APPLICATION NUMBER: US 08/279,823
 - (B) FILING DATE: 25-JUL-1994
- (vii) PRIOR APPLICATION DATA:
 - (A) APPLICATION NUMBER: US 07/681,078
 - (B) FILING DATE: 05-APR-1991
- (vii) PRIOR APPLICATION DATA:
 - (A) APPLICATION NUMBER: US 07/505,888
 - (B) FILING DATE: 05-APR-1990
- (vii) PRIOR APPLICATION DATA:
 - (A) APPLICATION NUMBER: US 07/420,921
 - (B) FILING DATE: 13-OCT-1989
- (vii) PRIOR APPLICATION DATA:
 - (A) APPLICATION NUMBER: US 07/367,486
 - (B) FILING DATE: 16-JUN-1989
- (vii) PRIOR APPLICATION DATA:
 - (A) APPLICATION NUMBER: US 07/336,672
 - (B) FILING DATE: 11-APR-1989
- (vii) PRIOR APPLICATION DATA:
 - (A) APPLICATION NUMBER: US 07/208,997
 - (B) FILING DATE: 17-JUN-1988

(viii) ATTORNEY/AGENT INFORMATION:
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(B) REGISTRATION NUMBER: 42,995
(C) REFERENCE/DOCKET NUMBER: 4600-0183.24

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(2) INFORMATION FOR SEQ ID NO:1:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 1295 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: NO

(vi) ORIGINAL SOURCE:
(C) INDIVIDUAL ISOLATE: 1.33 kb EcoRI insert of ET1.1,
forward sequence

(ix) FEATURE:
(A) NAME/KEY: CDS
(B) LOCATION: 1..1293

(ix) FEATURE:
(A) NAME/KEY: CDS
(B) LOCATION: 2..1294

(ix) FEATURE:
(A) NAME/KEY: CDS
(B) LOCATION: 3..1295

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

AGACCTGTCC CTGTTGCAGC TGTTCTACCA CCCTGCCCCG AGCTCGAACA GGGCCTTCTC	60
TACCTGCCCC AGGAGCTCAC CACCTGTGAT AGTGTCGTAA CATTTGAATT AACAGACATT	120
GTGCACTGCC GCATGGCCGC CCCGAGCCAG CGCAAGGCCG TGCTGTCCAC ACTCGTGGGC	180
CGCTACGGCG GTCGCACAAA GCTCTACAAT GCTTCCCACT CTGATGTTTCG CGACTCTCTC	240
GCCCGTTTTA TCCCGGCCAT TGGCCCCGTA CAGGTTACAA CTTGTGAATT GTACGAGCTA	300
GTGGAGGCCA TGGTCGAGAA GGGCCAGGAT GGCTCCGCCG TCCTTGAGCT TGATCTTTGC	360
AACCGTGACG TGTCCAGGAT CACCTTCTTC CAGAAAGATT GTAACAAGTT CACCACAGGT	420
GAGACCATTG CCCATGGTAA AGTGGGCCAG GGCATCTCGG CCTGGAGCAA GACCTTCTGC	480
GCCCTCTTTG GCCCTTGGTT CCGCGCTATT GAGAAGGCTA TTCTGGCCCT GCTCCCTCAG	540
GGTGTGTTTT ACGGTGATGC CTTTGATGAC ACCGTCTTCT CGGCGGCTGT GGCCGCAGCA	600

AAGGCATCCA TGGTGTGTTGA GAATGACTTT TCTGAGTTTG ACTCCACCCA GAATAACTTT 660
 TCTCTGGGTC TAGAGTGTGC TATTATGGAG GAGTGTGGGA TGCCGCAGTG GCTCATCCGC 720
 CTGTATCACC TTATAAGGTC TGCCTGGATC TTGCAGGCCC CGAAGGAGTC TCTGCGAGGG 780
 TTTTGAAGA AACACTCCGG TGAGCCCGGC ACTCTTCTAT GGAATACTGT CTGGAATATG 840
 GCCGTTATTA CCCACTGTTA TGAATTCCGC GATTTTCAGG TGGCTGCCTT TAAAGGTGAT 900
 GATTCGATAG TGCTTTGCAG TGAGTATCGT CAGAGTCCAG GAGCTGCTGT CCTGATCGCC 960
 GGCTGTGGCT TGAAGTTGAA GGTAGATTTT CGCCCGATCG GTTGTATGC AGGTGTTGTG 1020
 GTGGCCCCCG GCCTTGGCGC GCTCCCTGAT GTTGTGCGCT TCGCCGGCCG GCTTACCGAG 1080
 AAGAATTGGG GCCCTGGCCC TGAGCGGGCG GAGCAGCTCC GCCTCGCTGT TAGTGATTTT 1140
 CTCCGCAAGC TCACGAATGT AGCTCAGATG TGTGTGGATG TTGTTCCCG TGTTTATGGG 1200
 GTTTCCTG GACTCGTTCA TAACCTGATT GGCATGCTAC AGGCTGTTGC TGATGGCAAG 1260
 GCACATTTCA CTGAGTCAGT AAAACCAGTG CTCGA 1295

(2) INFORMATION FOR SEQ ID NO:2:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 431 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

Arg Pro Val Pro Val Ala Ala Val Leu Pro Pro Cys Pro Glu Leu Glu
 1 5 10 15
 Gln Gly Leu Leu Tyr Leu Pro Gln Glu Leu Thr Thr Cys Asp Ser Val
 20 25 30
 Val Thr Phe Glu Leu Thr Asp Ile Val His Cys Arg Met Ala Ala Pro
 35 40 45
 Ser Gln Arg Lys Ala Val Leu Ser Thr Leu Val Gly Arg Tyr Gly Gly
 50 55 60
 Arg Thr Lys Leu Tyr Asn Ala Ser His Ser Asp Val Arg Asp Ser Leu
 65 70 75 80
 Ala Arg Phe Ile Pro Ala Ile Gly Pro Val Gln Val Thr Thr Cys Glu
 85 90 95
 Leu Tyr Glu Leu Val Glu Ala Met Val Glu Lys Gly Gln Asp Gly Ser
 100 105 110
 Ala Val Leu Glu Leu Asp Leu Cys Asn Arg Asp Val Ser Arg Ile Thr
 115 120 125
 Phe Phe Gln Lys Asp Cys Asn Lys Phe Thr Thr Gly Glu Thr Ile Ala
 130 135 140

0954410-050701

His	Gly	Lys	Val	Gly	Gln	Gly	Ile	Ser	Ala	Trp	Ser	Lys	Thr	Phe	Cys	145	150	155	160
Ala	Leu	Phe	Gly	Pro	Trp	Phe	Arg	Ala	Ile	Glu	Lys	Ala	Ile	Leu	Ala	165	170	175	
Leu	Leu	Pro	Gln	Gly	Val	Phe	Tyr	Gly	Asp	Ala	Phe	Asp	Asp	Thr	Val	180	185	190	
Phe	Ser	Ala	Ala	Val	Ala	Ala	Ala	Lys	Ala	Ser	Met	Val	Phe	Glu	Asn	195	200	205	
Asp	Phe	Ser	Glu	Phe	Asp	Ser	Thr	Gln	Asn	Asn	Phe	Ser	Leu	Gly	Leu	210	215	220	
Glu	Cys	Ala	Ile	Met	Glu	Glu	Cys	Gly	Met	Pro	Gln	Trp	Leu	Ile	Arg	225	230	235	240
Leu	Tyr	His	Leu	Ile	Arg	Ser	Ala	Trp	Ile	Leu	Gln	Ala	Pro	Lys	Glu	245	250	255	
Ser	Leu	Arg	Gly	Phe	Trp	Lys	Lys	His	Ser	Gly	Glu	Pro	Gly	Thr	Leu	260	265	270	
Leu	Trp	Asn	Thr	Val	Trp	Asn	Met	Ala	Val	Ile	Thr	His	Cys	Tyr	Asp	275	280	285	
Phe	Arg	Asp	Phe	Gln	Val	Ala	Ala	Phe	Lys	Gly	Asp	Asp	Ser	Ile	Val	290	295	300	
Leu	Cys	Ser	Glu	Tyr	Arg	Gln	Ser	Pro	Gly	Ala	Ala	Val	Leu	Ile	Ala	305	310	315	320
Gly	Cys	Gly	Leu	Lys	Leu	Lys	Val	Asp	Phe	Arg	Pro	Ile	Gly	Leu	Tyr	325	330	335	
Ala	Gly	Val	Val	Val	Ala	Pro	Gly	Leu	Gly	Ala	Leu	Pro	Asp	Val	Val	340	345	350	
Arg	Phe	Ala	Gly	Arg	Leu	Thr	Glu	Lys	Asn	Trp	Gly	Pro	Gly	Pro	Glu	355	360	365	
Arg	Ala	Glu	Gln	Leu	Arg	Leu	Ala	Val	Ser	Asp	Phe	Leu	Arg	Lys	Leu	370	375	380	
Thr	Asn	Val	Ala	Gln	Met	Cys	Val	Asp	Val	Val	Ser	Arg	Val	Tyr	Gly	385	390	395	400
Val	Ser	Pro	Gly	Leu	Val	His	Asn	Leu	Ile	Gly	Met	Leu	Gln	Ala	Val	405	410	415	
Ala	Asp	Gly	Lys	Ala	His	Phe	Thr	Glu	Ser	Val	Lys	Pro	Val	Leu		420	425	430	

(2) INFORMATION FOR SEQ ID NO:3:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 18 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: NO

(vi) ORIGINAL SOURCE:

(C) INDIVIDUAL ISOLATE: linker - top (5') sequence

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

GGAATTCGCG GCCGCTCG

18

(2) INFORMATION FOR SEQ ID NO:4:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 20 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: NO

(vi) ORIGINAL SOURCE:

(C) INDIVIDUAL ISOLATE: linker - bottom (3') sequence

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

CGAGCGGCCG CGAATTCCTT

20

(2) INFORMATION FOR SEQ ID NO:5:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 1295 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: double

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: NO

(vi) ORIGINAL SOURCE:

(C) INDIVIDUAL ISOLATE: 1.33 kb EcoRI insert of ET1.1, reverse sequence

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

TCGAGCACTG GTTTTACTGA CTCAGTGAAA TGTGCCTTGC CATCAGCAAC AGCCTGTAGC

ATGCCAATCA GGTATGAAC GAGTCCAGGG GAAACCCCAT AAACACGGGA AACAAACATCC

60

120

ACACACATCT GAGCTACATT CGTGAGCTTG CGGAGGAAAT CACTAACAGC GAGGCGGAGC	180
TGCTCCGCCC GCTCAGGGCC AGGGCCCCAA TTCTTCTCGG TAAGCCGGCC GGCGAAGCGC	240
ACAACATCAG GGAGCGCGCC AAGGCCGGGG GCCACCACAA CACCTGCATA CAAACCGATC	300
GGGCGGAAAT CTACCTTCAA CTTCAAGCCA CAGCCGGCGA TCAGGACAGC AGCTCCTGGA	360
CTCTGACGAT ACTCACTGCA AAGCACTATC GAATCATCAC CTTTAAAGGC AGCCACCTGA	420
AAATCGCGGA AGTCATAACA GTGGGTAATA ACGGCCATAT TCCAGACAGT ATTCCATAGA	480
AGAGTGCCGG GCTCACCGBA GTGTTTCTTC CAAAACCCTC GCAGAGACTC CTTGCGGGCC	540
TGCAAGATCC ACGCAGACCT TATAAGGTGA TACAGGCGGA TGAGCCACTG CGGCATCCCA	600
CACTCCTCCA TAATAGCACA CTCTAGACCC AGAGAAAAGT TATTCTGGGT GGAGTCAAAC	660
TCAGAAAAGT CATTCTCAA CACCATGGAT GCCTTTGCTG CGGCCACAGC CGCCGAGAAG	720
ACGGTGTCAT CAAAGGCATC ACCGTAAAAC ACACCCTGAG GGAGCAGGGC CAGAATAGCC	780
TTCTCAATAG CGCGGAACCA AGGGCCAAAG AGGGCGCAGA AGGTCTTGCT CCAGGCCGAG	840
ATGCCCTGGC CCACTTTACC ATGGGCAATG GTCTCACCTG TGGTGAACCT GTTACAATCT	900
TTCTGGAAGA AGGTGATCCT GGACACGTCA CGGTTGCAA GATCAAGCTC AAGGACGGCG	960
GAGCCATCCT GGCCCTTCTC GACCATGGCC TCCACTAGCT CGTACAATTC ACAAGTTGTA	1020
ACCTGTACGG GGCCAATGGC CGGGATAAAA CGGGCGAGAG AGTCGCGAAC ATCAGAGTGG	1080
GAAGCATTGT AGAGCTTTGT GCGACCGCCG TAGCGGCCCA CGAGTGTGGA CAGCACGGCC	1140
TTGCGCTGGC TCGGGGCGGC CATGCGGCAG TGCACAATGT CTGTTAATTC AAATGTTACG	1200
ACACTATCAC AGGTGGTGAG CTCCTGGGGC AGGTAGAGAA GGCCCTGTTC GAGCTCGGGG	1260
CAGGGTGGTA GAACAGCTGC AACAGGGACA GGTCT	1295

(2) INFORMATION FOR SEQ ID NO:6:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 7195 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: double
 - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: DNA
- (iii) HYPOTHETICAL: NO
- (iv) ANTI-SENSE: NO
- (vi) ORIGINAL SOURCE:
 - (C) INDIVIDUAL ISOLATE: HEV - Burma strain
- (ix) FEATURE:
 - (A) NAME/KEY: CDS
 - (B) LOCATION: 28..5106

(ix) FEATURE:

(A) NAME/KEY: CDS
(B) LOCATION: 5147..7126

(ix) FEATURE:

(A) NAME/KEY: CDS
(B) LOCATION: 5106..5474

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

AGGCAGACCA CATATGTGGT CGATGCCATG GAGGCCCATC AGTTTATTAA GGCTCCTGGC	60
ATCACTACTG CTATTGAGCA GGCTGCTCTA GCAGCGGCCA ACTCTGCCCT GGCGAATGCT	120
GTGGTAGTTA GGCCTTTTCT CTCTACCAG CAGATTGAGA TCCTCATTA CTAATGCAA	180
CCTCGCCAGC TTGTTTTCCG CCCCAGGTT TTCTGGAATC ATCCCATCCA GCGTGTATC	240
CATAACGAGC TGGAGCTTTA CTGCCGCGCC CGCTCCGGCC GCTGTCTTGA AATTGGCGCC	300
CATCCCCGCT CAATAAATGA TAATCCTAAT GTGGTCCACC GCTGCTTCCT CCGCCCTGTT	360
GGGCGTGATG TTCAGCGCTG GTATACTGCT CCCACTCGCG GGCCGGCTGC TAATTGCCGG	420
CGTCCGCGC TCGCGGGCT TCCCCTGCT GACCGCACTT ACTGCCTCGA CGGGTTTCT	480
GGCTGTAAC TTCCCGCCA GACTGGCATC GCCCTCTACT CCCTTCATGA TATGTCACCA	540
TCTGATGTCG CCGAGGCCAT GTTCCGCCAT GGTATGACGC GGCTCTATGC CGCCCTCCAT	600
CTTCCGCTG AGGTCTGCT GCCCCCTGGC ACATATCGCA CCGCATCGTA TTTGCTAATT	660
CATGACGGTA GGCGCGTTGT GGTGACGTAT GAGGGTGATA CTAGTGCTGG TTACAACCAC	720
GATGTCTCCA ACTTGCGCTC CTGGATTAGA ACCACCAAGG TTACCGGAGA CCATCCCCCTC	780
GTTATCGAGC GGGTTAGGGC CATTGGCTGC CACTTTGTTC TCTTGCTCAC GGCAGCCCCG	840
GAGCCATCAC CTATGCCTTA TGTTCTTAC CCCCAGTCTA CCGAGGTCTA TGTCCGATCG	900
ATCTTCGGCC CGGGTGGCAC CCCTTCCTTA TTCCCAACCT CATGCTCCAC TAAGTCGACC	960
TTCCATGCTG TCCCTGCCCA TATTGGGAC CGTCTTATGC TGTTCCGGGC CACCTTGGAT	1020
GACCAAGCCT TTTGCTGCTC CCGTTTAATG ACCTACCTTC GCGGCATTAG CTACAAGGTC	1080
ACTGTTGGTA CCCTTGTGGC TAATGAAGGC TGAATGCCT CTGAGGACGC CCTCACAGCT	1140
GTTATCACTG CCGCTACCT TACCATTGTC CACCAGCGGT ATCTCCGCAC CCAGGCTATA	1200
TCCAAGGGGA TCGGTCGTCT GGAACGGGAG CATGCCAGA AGTTTATAAC ACGCCTCTAC	1260
AGCTGGCTCT TCGAGAAGTC CGGCCGTGAT TACATCCCTG GCCGTCAGTT GGAGTTCTAC	1320
GCCCAGTGCA GGCGCTGGCT CTCCGCCGGC TTTCATCTTG ATCCACGGGT GTTGGTTTTT	1380
GACGAGTCGG CCCCCTGCCA TTGTAGGACC GCGATCCGTA AGGCGCTCTC AAAGTTTTGC	1440
TGCTTCATGA AGTGGCTTGG TCAGGAGTGC ACCTGCTTCC TTCAGCTGC AGAAGGCGCC	1500
GTCGGCGACC AGGGTCATGA TAATGAAGCC TATGAGGGGT CCGATGTTGA CCCTGCTGAG	1560

TCCGCCATTA	GTGACATATC	TGGGTCCTAT	GTCGTCCCTG	GCACTGCCCT	CCAACCGCTC	1620
TACCAGGCCC	TCGATCTCCC	CGCTGAGATT	GTGGCTCGCG	CGGGCCGGCT	GACCGCCACA	1680
GTAAAGGTCT	CCCAGGTCGA	TGGGCGGATC	GATTGCGAGA	CCCTTCTTGG	TAACAAAACC	1740
TTTCGCACGT	CGTTCGTTGA	CGGGGCGGTC	TTAGAGACCA	ATGGCCCAGA	GCGCCACAAT	1800
CTCTCCTTCG	ATGCCAGTCA	GAGCACTATG	GCCGCTGGCC	CTTTCAGTCT	CACCTATGCC	1860
GCCTCTGCAG	CTGGGCTGGA	GGTGCCTAT	GTTGCTGCCG	GGCTTGACCA	TCGGGCGGTT	1920
TTTGCCCCCG	GTGTTTCACC	CCGGTCAGCC	CCCGGCGAGG	TTACCGCCTT	CTGCTCTGCC	1980
CTATACAGGT	TTAACCGTGA	GGCCCAGCGC	CATTGCTGA	TCGGTAACTT	ATGTTCCAT	2040
CCTGAGGGAC	TCATTGGCCT	CTTCGCCCCG	TTTTCGCCCCG	GGCATGTTTG	GGAGTCGGCT	2100
AATCCATTCT	GTGGCGAGAG	CACACTTTAC	ACCCGTA CT T	GGTCGGAGGT	TGATGCCGTC	2160
TCTAGTCCAG	CCCGGCCTGA	CTTAGGTTTT	ATGTCTGAGC	CTTCTATACC	TAGTAGGGCC	2220
GCCACGCCTA	CCCTGGCGGC	CCCTCTACCC	CCCCCTGCAC	CGGACCCTTC	CCCCCTCCC	2280
TCTGCCCCGG	CGCTTGCTGA	GCCGGCTTCT	GGCGCTACCG	CCGGGGCCCC	GGCCATAACT	2340
CACCAGACGG	CCCGGCACCG	CGCCTGCTC	TTCACCTACC	CGGATGGCTC	TAAGGTATTC	2400
GCCGGCTCGC	TGTTGAGTC	GACATGCACG	TGGCTCGTTA	ACGCGTCTAA	TGTTGACCAC	2460
CGCCCTGGCG	GCGGGCTTTG	CCATGCATTT	TACCAAAGGT	ACCCCGCCTC	CTTTGATGCT	2520
GCCTCTTTTG	TGATGCGCGA	CGGCGCGGCC	GCGTACACAC	TAACCCCCCG	GCCAATAATT	2580
CACGCTGTGC	CCCCTGATTA	TAGGTTGGAA	CATAACCCAA	AGAGGCTTGA	GGCTGCTTAT	2640
CGGGAAACTT	GCTCCCGCCT	CGGCACCGCT	GCATACCCGC	TCCTCGGGAC	CGGCATATAC	2700
CAGGTGCCGA	TCGGCCCCAG	TTTTGACGCC	TGGGAGCGGA	ACCACCGCCC	CGGGGATGAG	2760
TTGTACCTTC	CTGAGCTTGC	TGCCAGATGG	TTTGAGGCCA	ATAGGCCGAC	CCGCCCCACT	2820
CTCACTATAA	CTGAGGATGT	TGCACGGACA	GCGAATCTGG	CCATCGAGCT	TGACTCAGCC	2880
ACAGATGTGC	GCCGGGCCTG	TGCCGGCTGT	CGGGTCACCC	CCGGCGTTGT	TCAGTACCAG	2940
TTTACTGCAG	GTGTGCCTGG	ATCCGGCAAG	TCCCGCTCTA	TCACCCAAGC	CGATGTGGAC	3000
GTTGTCTGTT	TCCCGACGCG	TGAGTTGCGT	AATGCCTGGC	GCCGTCGCGG	CTTTGCTGCT	3060
TTTACCCCCG	ATACTGCCGC	CAGAGTCACC	CAGGGGCGCC	GGGTTGTCAT	TGATGAGGCT	3120
CCATCCCTCC	CCCCTCACCT	GCTGCTGCTC	CACATGCAGC	GGGCCGCCAC	CGTCCACCTT	3180
CTTGCGGACC	CGAACCAGAT	CCCAGCCATC	GA C T T T G A G C	ACGCTGGGCT	CGTCCCCGCC	3240
ATCAGGCCCG	ACTTAGGCC	CACCTCCTGG	TGGCATGTTA	CCCATCGCTG	GCCTGCGGAT	3300
GTATGCGAGC	TCATCCGTGG	TGCATACCCC	ATGATCCAGA	CCACTAGCCG	GGTTCTCCGT	3360
TCGTTGTTCT	GGGGTGAGCC	TGCCGTCGGG	CAGAACTAG	TGTTACCCCA	GGCGGCCAAG	3420

CCCGCCAACC CCGGCTCAGT GACGGTCCAC GAGGCGCAGG GCGCTACCTA CACGGAGACC	3480
ACTATTATTG CCACAGCAGA TGCCCGGGGC CTTATTCAGT CGTCTCGGGC TCATGCCATT	3540
GTTGCTCTGA CGCGCCACAC TGAGAAGTGC GTCATCATTG ACGCACCAGG CCTGCTTCGC	3600
GAGGTGGGCA TCTCCGATGC AATCGTTAAT AACTTTTTTC TCGCTGGTGG CGAAATTGGT	3660
CACCAGCGCC CATCAGTTAT TCCCCGTGGC AACCCTGACG CCAATGTTGA CACCCTGGCT	3720
GCCTTCCCGC CGTCTTGCCA GATTAGTGCC TTCCATCAGT TGGCTGAGGA GCTTGGCCAC	3780
AGACCTGTCC CTGTTGCAGC TGTTCTACCA CCCTGCCCCG AGCTCGAACA GGGCCTTCTC	3840
TACCTGCCCC AGGAGCTCAC CACCTGTGAT AGTGTCGTAA CATTTGAATT AACAGACATT	3900
GTGCACTGCC GCATGGCCGC CCGAGCCAG CGCAAGGCCG TGCTGTCCAC ACTCGTGGGC	3960
CGCTACGGCG GTCGCACAAA GCTCTACAAT GCTTCCCCT CTGATGTTTCG CGACTCTCTC	4020
GCCCGTTTTA TCCCGGCCAT TGGCCCCGTA CAGGTTACAA CTTGTGAATT GTACGAGCTA	4080
GTGGAGGCCA TGGTCGAGAA GGGCCAGGAT GGCTCCGCCG TCCTTGAGCT TGATCTTTGC	4140
AACCGTGACG TGTCCAGGAT CACCTTCTTC CAGAAAGATT GTAACAAGTT CACCACAGGT	4200
GAGACCATTG CCCATGGTAA AGTGGGCCAG GGCATCTCGG CCTGGAGCAA GACCTTCTGC	4260
GCCCTCTTTG GCCCTTGGTT CCGCGCTATT GAGAAGGCTA TTCTGGCCCT GCTCCCTCAG	4320
GGTGTGTTTT ACGGTGATGC CTTTGATGAC ACCGTCTTCT CGGCGGCTGT GGCCGAGCA	4380
AAGGCATCCA TGGTGTGTTGA GAATGACTTT TCTGAGTTTG ACTCCACCCA GAATACTTT	4440
TCTCTGGGTC TAGAGTGTGC TATTATGGAG GAGTGTGGGA TGCCGCAGTG GCTCATCCGC	4500
CTGTATCACC TTATAAGGTC TGCCTGGATC TTGCAGGCCC CGAAGGAGTC TCTGCGAGGG	4560
TTTTGGAAGA AACACTCCGG TGAGCCCGGC ACTCTTCTAT GGAATACTGT CTGGAATATG	4620
GCCGTTATTA CCCACTGTGA TGAATTCGCG GATTTTCAGG TGGCTGCCTT TAAAGGTGAT	4680
GATTCGATAG TGCTTTGCAG TGAGTATCGT CAGAGTCCAG GAGCTGCTGT CCTGATCGCC	4740
GGCTGTGGCT TGAAGTTGAA GGTAATTTT CGCCCGATCG GTTTGTATGC AGGTGTTGTG	4800
GTGGCCCCCG GCCTTGGCGC GCTCCCTGAT GTTGTGCGCT TCGCCGGCCG GCTTACCGAG	4860
AAGAATTGGG GCCCTGGCCC TGAGCGGGCG GAGCAGCTCC GCCTCGCTGT TAGTGATTTC	4920
CTCCGCAAGC TCACGAATGT AGCTCAGATG TGTGTGGATG TTGTTTCCCG TGTTTATGGG	4980
GTTTCCCCTG GACTCGTTCA TAACCTGATT GGCATGCTAC AGGCTGTTGC TGATGGCAAG	5040
GCACATTTCA CTGAGTCAGT AAAACCACTG CTCGACTTGA CAAATTCAAT CTTGTGTCGG	5100
GTGGAATGAA TAACATGTCT TTTGCTGCGC CCATGGGTTC GCGACCATGC GCCCTCGGCC	5160
TATTTTGTTG CTGCTCCTCA TGTTTTTGCC TATGCTGCCC GCGCCACCGC CCGGTCAGCC	5220
GTCTGGCCGC CGTCGTGGGC GGCGCAGCGG CGGTTCCGGC GGTGGTTTCT GGGGTGACCG	5280

GGTTGATTCT CAGCCCTTCG CAATCCCCTA TATTCATCCA ACCAACCCCT TCGCCCCCGA	5340
TGTCACCGCT GCGGCCGGGG CTGGACCTCG TGTTTCGCCAA CCCGCCCGAC CACTCGGCTC	5400
CGCTTGGCGT GACCAGGCCC AGCGCCCCGC CGTTGCCTCA CGTCGTAGAC CTACCACAGC	5460
TGGGGCCGCG CCGCTAACCG CGGTCGCTCC GGCCCATGAC ACCCCGCCAG TGCCTGATGT	5520
CGACTCCCGC GCGGCCATCT TGCGCCGGCA GTATAACCTA TCAACATCTC CCCTTACCTC	5580
TTCCGTGGCC ACCGGCACTA ACCTGGTTCT TTATGCCGCC CCTCTTAGTC CGCTTTTACC	5640
CCTTCAGGAC GGCACCAATA CCCATATAAT GGCCACGGAA GCTTCTAATT ATGCCCAGTA	5700
CCGGGTTGCC CGTGCCACAA TCCGTTACCG CCCGCTGGTC CCCAATGCTG TCGGCGGTGA	5760
CGCCATCTCC ATCTCATTCT GGCCACAGAC CACCACCACC CCGACGTCCG TTGATATGAA	5820
TTCAATAACC TCGACGGATG TTCGTATTTT AGTCCAGCCC GGCATAGCCT CTGAGCTTGT	5880
GATCCCAAGT GAGCGCCTAC ACTATCGTAA CCAAGGCTGG CGCTCCGTCG AGACCTCTGG	5940
GGTGGCTGAG GAGGAGGCTA CCTCTGGTCT TGTTATGCTT TGCATACATG GCTCACTCGT	6000
AAATTCCCTAT ACTAATACAC CCTATACCGG TGCCCTCGGG CTGTTGGACT TTGCCCTTGA	6060
GCTTGAGTTT CGCAACCTTA CCCCCGGTAA CACCAATACG CGGGTCTCCC GTTATTCCAG	6120
CACTGCTCGC CACCGCCTTC GTCGCGGTGC GGACGGGACT GCCGAGCTCA CCACCACGGC	6180
TGCTACCCGC TTTATGAAGG ACCTCTATTT TACTAGTACT AATGGTGTCTG GTGAGATCGG	6240
CCGCGGGATA GCCCTCACCC TGTTC AACCT TGCTGACACT CTGCTTGGCG GCCTGCCGAC	6300
AGAATTGATT TCGTCGGCTG GTGGCCAGCT GTTCTACTCC CGTCCCGTTG TCTCAGCCAA	6360
TGGCGAGCCG ACTGTTAAGT TGTATACATC TGTAGAGAAT GCTCAGCAGG ATAAGGGTAT	6420
TGCAATCCCG CATGACATTG ACCTCGGAGA ATCTCGTGTG GTTATTTCAGG ATTATGATAA	6480
CCAACATGAA CAAGATCGGC CGACGCCTTC TCCAGCCCCA TCGCGCCCTT TCTCTGTCCT	6540
TCGAGCTAAT GATGTGCTTT GGCTCTCTCT CACCGCTGCC GAGTATGACC AGTCCACTTA	6600
TGGCTCTTCG ACTGGCCCAG TTTATGTTTC TGA CTCTGTG ACCTTGGTTA ATGTTGCGAC	6660
CGGCGCGCAG GCCGTTGCCC GGTGCTCGA TTGGACCAAG GTCACACTTG ACGGTGCCCC	6720
CCTCTCCACC ATCCAGCAGT ACTCGAAGAC CTCTTTGTC CTGCCGCTCC GCGGTAAGCT	6780
CTCTTTCTGG GAGGCAGGCA CAACTAAAGC CGGGTACCCT TATAATTATA ACACCACTGC	6840
TAGCGACCAA CTGCTTGTCG AGAATGCCGC CGGGCACCGG GTCGCTATTT CCACTTACAC	6900
CACTAGCCTG GGTGCTGGTC CCGTCTCCAT TTCTGCGGTT GCCGTTTTAG CCCCCCACTC	6960
TGCGCTAGCA TTGCTTGAGG ATACCTTGGA CTACCCTGCC CGCGCCCATTA CTTTTGATGA	7020
TTTCTGCCCC GAGTGCCGCC CCCTTGCCCT TCAGGGCTGC GCTTTCCAGT CTACTGTGCG	7080
TGAGCTTCAG CGCCTTAAGA TGAAGGTGGG TAAAACTCGG GAGTTGTAGT TTATTTGCTT	7140

245										250					255												
Arg	Ala	Ile	Gly	Cys	His	Phe	Val	Leu	Leu	Leu	Thr	Ala	Ala	Pro	Glu												
			260					265					270														
Pro	Ser	Pro	Met	Pro	Tyr	Val	Pro	Tyr	Pro	Arg	Ser	Thr	Glu	Val	Tyr												
		275					280					285															
Val	Arg	Ser	Ile	Phe	Gly	Pro	Gly	Gly	Thr	Pro	Ser	Leu	Phe	Pro	Thr												
	290					295					300																
Ser	Cys	Ser	Thr	Lys	Ser	Thr	Phe	His	Ala	Val	Pro	Ala	His	Ile	Trp												
305					310					315					320												
Asp	Arg	Leu	Met	Leu	Phe	Gly	Ala	Thr	Leu	Asp	Asp	Gln	Ala	Phe	Cys												
				325					330					335													
Cys	Ser	Arg	Leu	Met	Thr	Tyr	Leu	Arg	Gly	Ile	Ser	Tyr	Lys	Val	Thr												
			340					345					350														
Val	Gly	Thr	Leu	Val	Ala	Asn	Glu	Gly	Trp	Asn	Ala	Ser	Glu	Asp	Ala												
		355					360					365															
Leu	Thr	Ala	Val	Ile	Thr	Ala	Ala	Tyr	Leu	Thr	Ile	Cys	His	Gln	Arg												
	370					375					380																
Tyr	Leu	Arg	Thr	Gln	Ala	Ile	Ser	Lys	Gly	Met	Arg	Arg	Leu	Glu	Arg												
385					390					395					400												
Glu	His	Ala	Gln	Lys	Phe	Ile	Thr	Arg	Leu	Tyr	Ser	Trp	Leu	Phe	Glu												
				405					410					415													
Lys	Ser	Gly	Arg	Asp	Tyr	Ile	Pro	Gly	Arg	Gln	Leu	Glu	Phe	Tyr	Ala												
			420					425					430														
Gln	Cys	Arg	Arg	Trp	Leu	Ser	Ala	Gly	Phe	His	Leu	Asp	Pro	Arg	Val												
		435					440					445															
Leu	Val	Phe	Asp	Glu	Ser	Ala	Pro	Cys	His	Cys	Arg	Thr	Ala	Ile	Arg												
	450					455					460																
Lys	Ala	Leu	Ser	Lys	Phe	Cys	Cys	Phe	Met	Lys	Trp	Leu	Gly	Gln	Glu												
465					470					475					480												

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Val	Asp	Gly	Ala	Val	Leu	Glu	Thr	Asn	Gly	Pro	Glu	Arg	His	Asn	Leu
			580					585					590		
Ser	Phe	Asp	Ala	Ser	Gln	Ser	Thr	Met	Ala	Ala	Gly	Pro	Phe	Ser	Leu
		595					600					605			
Thr	Tyr	Ala	Ala	Ser	Ala	Ala	Gly	Leu	Glu	Val	Arg	Tyr	Val	Ala	Ala
	610					615					620				
Gly	Leu	Asp	His	Arg	Ala	Val	Phe	Ala	Pro	Gly	Val	Ser	Pro	Arg	Ser
625					630					635					640
Ala	Pro	Gly	Glu	Val	Thr	Ala	Phe	Cys	Ser	Ala	Leu	Tyr	Arg	Phe	Asn
				645					650					655	
Arg	Glu	Ala	Gln	Arg	His	Ser	Leu	Ile	Gly	Asn	Leu	Trp	Phe	His	Pro
			660					665						670	
Glu	Gly	Leu	Ile	Gly	Leu	Phe	Ala	Pro	Phe	Ser	Pro	Gly	His	Val	Trp
		675					680					685			
Glu	Ser	Ala	Asn	Pro	Phe	Cys	Gly	Glu	Ser	Thr	Leu	Tyr	Thr	Arg	Thr
	690					695					700				
Trp	Ser	Glu	Val	Asp	Ala	Val	Ser	Ser	Pro	Ala	Arg	Pro	Asp	Leu	Gly
705					710					715					720
Phe	Met	Ser	Glu	Pro	Ser	Ile	Pro	Ser	Arg	Ala	Ala	Thr	Pro	Thr	Leu
				725					730					735	
Ala	Ala	Pro	Leu	Pro	Pro	Pro	Ala	Pro	Asp	Pro	Ser	Pro	Pro	Pro	Ser
			740					745					750		
Ala	Pro	Ala	Leu	Ala	Glu	Pro	Ala	Ser	Gly	Ala	Thr	Ala	Gly	Ala	Pro
		755					760					765			
Ala	Ile	Thr	His	Gln	Thr	Ala	Arg	His	Arg	Arg	Leu	Leu	Phe	Thr	Tyr
	770					775					780				
Pro	Asp	Gly	Ser	Lys	Val	Phe	Ala	Gly	Ser	Leu	Phe	Glu	Ser	Thr	Cys
785					790					795					800
Thr	Trp	Leu	Val	Asn	Ala	Ser	Asn	Val	Asp	His	Arg	Pro	Gly	Gly	Gly
				805					810					815	
Leu	Cys	His	Ala	Phe	Tyr	Gln	Arg	Tyr	Pro	Ala	Ser	Phe	Asp	Ala	Ala
			820					825					830		
Ser	Phe	Val	Met	Arg	Asp	Gly	Ala	Ala	Ala	Tyr	Thr	Leu	Thr	Pro	Arg
		835					840					845			
Pro	Ile	Ile	His	Ala	Val	Ala	Pro	Asp	Tyr	Arg	Leu	Glu	His	Asn	Pro
	850					855					860				
Lys	Arg	Leu	Glu	Ala	Ala	Tyr	Arg	Glu	Thr	Cys	Ser	Arg	Leu	Gly	Thr
865					870					875					880
Ala	Ala	Tyr	Pro	Leu	Leu	Gly	Thr	Gly	Ile	Tyr	Gln	Val	Pro	Ile	Gly
				885					890					895	
Pro	Ser	Phe	Asp	Ala	Trp	Glu	Arg	Asn	His	Arg	Pro	Gly	Asp	Glu	Leu
			900					905					910		

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Tyr Leu Pro Glu Leu Ala Ala Arg Trp Phe Glu Ala Asn Arg Pro Thr
915 920 925

Arg Pro Thr Leu Thr Ile Thr Glu Asp Val Ala Arg Thr Ala Asn Leu
930 935 940

Ala Ile Glu Leu Asp Ser Ala Thr Asp Val Gly Arg Ala Cys Ala Gly
945 950 955 960

Cys Arg Val Thr Pro Gly Val Val Gln Tyr Gln Phe Thr Ala Gly Val
965 970 975

Pro Gly Ser Gly Lys Ser Arg Ser Ile Thr Gln Ala Asp Val Asp Val
980 985 990

Val Val Val Pro Thr Arg Glu Leu Arg Asn Ala Trp Arg Arg Arg Gly
995 1000 1005

Phe Ala Ala Phe Thr Pro His Thr Ala Ala Arg Val Thr Gln Gly Arg
1010 1015 1020

Arg Val Val Ile Asp Glu Ala Pro Ser Leu Pro Pro His Leu Leu Leu
1025 1030 1035 1040

Leu His Met Gln Arg Ala Ala Thr Val His Leu Leu Gly Asp Pro Asn
1045 1050 1055

Gln Ile Pro Ala Ile Asp Phe Glu His Ala Gly Leu Val Pro Ala Ile
1060 1065 1070

Arg Pro Asp Leu Gly Pro Thr Ser Trp Trp His Val Thr His Arg Trp
1075 1080 1085

Pro Ala Asp Val Cys Glu Leu Ile Arg Gly Ala Tyr Pro Met Ile Gln
1090 1095 1100

Thr Thr Ser Arg Val Leu Arg Ser Leu Phe Trp Gly Glu Pro Ala Val
1105 1110 1115 1120

Gly Gln Lys Leu Val Phe Thr Gln Ala Ala Lys Pro Ala Asn Pro Gly
1125 1130 1135

Ser Val Thr Val His Glu Ala Gln Gly Ala Thr Tyr Thr Glu Thr Thr
1140 1145 1150

Ile Ile Ala Thr Ala Asp Ala Arg Gly Leu Ile Gln Ser Ser Arg Ala
1155 1160 1165

His Ala Ile Val Ala Leu Thr Arg His Thr Glu Lys Cys Val Ile Ile
1170 1175 1180

Asp Ala Pro Gly Leu Leu Arg Glu Val Gly Ile Ser Asp Ala Ile Val
1185 1190 1195 1200

Asn Asn Phe Phe Leu Ala Gly Gly Glu Ile Gly His Gln Arg Pro Ser
1205 1210 1215

Val Ile Pro Arg Gly Asn Pro Asp Ala Asn Val Asp Thr Leu Ala Ala
1220 1225 1230

Phe Pro Pro Ser Cys Gln Ile Ser Ala Phe His Gln Leu Ala Glu Glu

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1235	1240	1245
Leu Gly His Arg Pro Val	Pro Val Ala Ala Val	Leu Pro Pro Cys Pro
1250	1255	1260
Glu Leu Glu Gln Gly	Leu Leu Tyr Leu Pro Gln Glu Leu Thr Thr Cys	
1265	1270	1275 1280
Asp Ser Val Val Thr Phe Glu Leu Thr	Asp Ile Val His Cys Arg Met	
	1285 1290	1295
Ala Ala Pro Ser Gln Arg Lys Ala Val Leu Ser Thr Leu Val Gly Arg		
	1300 1305	1310
Tyr Gly Gly Arg Thr Lys Leu Tyr Asn Ala Ser His Ser Asp Val Arg		
	1315 1320	1325
Asp Ser Leu Ala Arg Phe Ile Pro Ala Ile Gly Pro Val Gln Val Thr		
	1330 1335	1340
Thr Cys Glu Leu Tyr Glu Leu Val Glu Ala Met Val Glu Lys Gly Gln		
	1345 1350	1355 1360
Asp Gly Ser Ala Val Leu Glu Leu Asp Leu Cys Asn Arg Asp Val Ser		
	1365 1370	1375
Arg Ile Thr Phe Phe Gln Lys Asp Cys Asn Lys Phe Thr Thr Gly Glu		
	1380 1385	1390
Thr Ile Ala His Gly Lys Val Gly Gln Gly Ile Ser Ala Trp Ser Lys		
	1395 1400	1405
Thr Phe Cys Ala Leu Phe Gly Pro Trp Phe Arg Ala Ile Glu Lys Ala		
	1410 1415	1420
Ile Leu Ala Leu Leu Pro Gln Gly Val Phe Tyr Gly Asp Ala Phe Asp		
	1425 1430	1435 1440
Asp Thr Val Phe Ser Ala Ala Val Ala Ala Lys Ala Ser Met Val		
	1445 1450	1455
Phe Glu Asn Asp Phe Ser Glu Phe Asp Ser Thr Gln Asn Asn Phe Ser		
	1460 1465	1470
Leu Gly Leu Glu Cys Ala Ile Met Glu Glu Cys Gly Met Pro Gln Trp		
	1475 1480	1485
Leu Ile Arg Leu Tyr His Leu Ile Arg Ser Ala Trp Ile Leu Gln Ala		
	1490 1495	1500
Pro Lys Glu Ser Leu Arg Gly Phe Trp Lys Lys His Ser Gly Glu Pro		
	1505 1510	1515 1520
Gly Thr Leu Leu Trp Asn Thr Val Trp Asn Met Ala Val Ile Thr His		
	1525 1530	1535
Cys Tyr Asp Phe Arg Asp Phe Gln Val Ala Ala Phe Lys Gly Asp Asp		
	1540 1545	1550
Ser Ile Val Leu Cys Ser Glu Tyr Arg Gln Ser Pro Gly Ala Ala Val		
	1555 1560	1565

Leu	Ile	Ala	Gly	Cys	Gly	Leu	Lys	Val	Asp	Phe	Arg	Pro	Ile
1570						1575			1580				
Gly	Leu	Tyr	Ala	Gly	Val	Val	Val	Ala	Pro	Gly	Leu	Gly	Ala
1585					1590				1595				Pro
1600													
Asp	Val	Val	Arg	Phe	Ala	Gly	Arg	Leu	Thr	Glu	Lys	Asn	Trp
				1605					1610				Gly
													Pro
Gly	Pro	Glu	Arg	Ala	Glu	Gln	Leu	Arg	Leu	Ala	Val	Ser	Asp
			1620					1625					Phe
													Leu
Arg	Lys	Leu	Thr	Asn	Val	Ala	Gln	Met	Cys	Val	Asp	Val	Val
		1635					1640					1645	Ser
													Arg
Val	Tyr	Gly	Val	Ser	Pro	Gly	Leu	Val	His	Asn	Leu	Ile	Gly
1650						1655					1660		Met
													Leu
Gln	Ala	Val	Ala	Asp	Gly	Lys	Ala	His	Phe	Thr	Glu	Ser	Val
1665					1670					1675.			Lys
													Pro
Val	Leu	Asp	Leu	Thr	Asn	Ser	Ile	Leu	Cys	Arg	Val	Glu	
				1685					1690				

(2) INFORMATION FOR SEQ ID NO:8:

- (A) LENGTH: 660 amino acids
(B) TYPE: amino acid
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

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Ser Ser Val Ala Thr Gly Thr Asn Leu Val Leu Tyr Ala Ala Pro Leu
145 150 155 160

Ser Pro Leu Leu Pro Leu Gln Asp Gly Thr Asn Thr His Ile Met Ala
165 170 175

Thr Glu Ala Ser Asn Tyr Ala Gln Tyr Arg Val Ala Arg Ala Thr Ile
180 185 190

Arg Tyr Arg Pro Leu Val Pro Asn Ala Val Gly Gly Tyr Ala Ile Ser
195 200 205

Ile Ser Phe Trp Pro Gln Thr Thr Thr Thr Pro Thr Ser Val Asp Met
210 215 220

Asn Ser Ile Thr Ser Thr Asp Val Arg Ile Leu Val Gln Pro Gly Ile
225 230 235 240

Ala Ser Glu Leu Val Ile Pro Ser Glu Arg Leu His Tyr Arg Asn Gln
245 250 255

Gly Trp Arg Ser Val Glu Thr Ser Gly Val Ala Glu Glu Glu Ala Thr
260 265 270

Ser Gly Leu Val Met Leu Cys Ile His Gly Ser Leu Val Asn Ser Tyr
275 280 285

Thr Asn Thr Pro Tyr Thr Gly Ala Leu Gly Leu Leu Asp Phe Ala Leu
290 295 300

Glu Leu Glu Phe Arg Asn Leu Thr Pro Gly Asn Thr Asn Thr Arg Val
305 310 315 320

Ser Arg Tyr Ser Ser Thr Ala Arg His Arg Leu Arg Arg Gly Ala Asp
325 330 335

Gly Thr Ala Glu Leu Thr Thr Thr Ala Ala Thr Arg Phe Met Lys Asp
340 345 350

Leu Tyr Phe Thr Ser Thr Asn Gly Val Gly Glu Ile Gly Arg Gly Ile
355 360 365

Ala Leu Thr Leu Phe Asn Leu Ala Asp Thr Leu Leu Gly Gly Leu Pro
370 375 380

Thr Glu Leu Ile Ser Ser Ala Gly Gly Gln Leu Phe Tyr Ser Arg Pro
385 390 395 400

Val Val Ser Ala Asn Gly Glu Pro Thr Val Lys Leu Tyr Thr Ser Val
405 410 415

Glu Asn Ala Gln Gln Asp Lys Gly Ile Ala Ile Pro His Asp Ile Asp
420 425 430

Leu Gly Glu Ser Arg Val Val Ile Gln Asp Tyr Asp Asn Gln His Glu
435 440 445

Gln Asp Arg Pro Thr Pro Ser Pro Ala Pro Ser Arg Pro Phe Ser Val
450 455 460

Leu Arg Ala Asn Asp Val Leu Trp Leu Ser Leu Thr Ala Ala Glu Tyr
 465 470 475 480
 Asp Gln Ser Thr Tyr Gly Ser Ser Thr Gly Pro Val Tyr Val Ser Asp
 485 490 495
 Ser Val Thr Leu Val Asn Val Ala Thr Gly Ala Gln Ala Val Ala Arg
 500 505 510
 Ser Leu Asp Trp Thr Lys Val Thr Leu Asp Gly Arg Pro Leu Ser Thr
 515 520 525
 Ile Gln Gln Tyr Ser Lys Thr Phe Phe Val Leu Pro Leu Arg Gly Lys
 530 535 540
 Leu Ser Phe Trp Glu Ala Gly Thr Thr Lys Ala Gly Tyr Pro Tyr Asn
 545 550 555 560
 Tyr Asn Thr Thr Ala Ser Asp Gln Leu Leu Val Glu Asn Ala Ala Gly
 565 570 575
 His Arg Val Ala Ile Ser Thr Tyr Thr Thr Ser Leu Gly Ala Gly Pro
 580 585 590
 Val Ser Ile Ser Ala Val Ala Val Leu Ala Pro His Ser Ala Leu Ala
 595 600 605
 Leu Leu Glu Asp Thr Leu Asp Tyr Pro Ala Arg Ala His Thr Phe Asp
 610 615 620
 Asp Phe Cys Pro Glu Cys Arg Pro Leu Gly Leu Gln Gly Cys Ala Phe
 625 630 635 640
 Gln Ser Thr Val Ala Glu Leu Gln Arg Leu Lys Met Lys Val Gly Lys
 645 650 655
 Thr Arg Glu Leu
 660

(2) INFORMATION FOR SEQ ID NO:9:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 123 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

Met Asn Asn Met Ser Phe Ala Ala Pro Met Gly Ser Arg Pro Cys Ala
 1 5 10 15
 Leu Gly Leu Phe Cys Cys Cys Ser Ser Cys Phe Cys Leu Cys Cys Pro
 20 25 30
 Arg His Arg Pro Val Ser Arg Leu Ala Ala Val Val Gly Gly Ala Ala
 35 40 45
 Ala Val Pro Ala Val Val Ser Gly Val Thr Gly Leu Ile Leu Ser Pro
 50 55 60

Ser Gln Ser Pro Ile Phe Ile Gln Pro Thr Pro Ser Pro Pro Met Ser
65 70 75 80
Pro Leu Arg Pro Gly Leu Asp Leu Val Phe Ala Asn Pro Pro Asp His
85 90 95
Ser Ala Pro Leu Gly Val Thr Arg Pro Ser Ala Pro Pro Leu Pro His
100 105 110
Val Val Asp Leu Pro Gln Leu Gly Pro Arg Arg
115 120

(2) INFORMATION FOR SEQ ID NO:10:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 7171 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: NO

(vi) ORIGINAL SOURCE:
(C) INDIVIDUAL ISOLATE: Composite Mexico strain

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

GCCATGGAGG CCCACCAGTT CATTAAGGCT CCTGGCATCA CTACTGCTAT TGAGCAAGCA	60
GCTCTAGCAG CGGCCAACTC CGCCCTTGCG AATGCTGTGG TGGTCCGGCC TTTCTTTTCC	120
CATCAGCAGG TTGAGATCCT TATAAATCTC ATGCAACCTC GGCAGCTGGT GTTTCGTCCT	180
GAGGTTTTTT GGAATCACCC GATTCAACGT GTTATACATA ATGAGCTTGA GCAGTATTGC	240
CGTGCTCGCT CGGGTCGCTG CCTTGAGATT GGAGCCCACC CACGCTCCAT TAATGATAAT	300
CCTAATGTCC TCCATCGCTG CTTTCTCCAC CCCGTCGGCC GGGATGTTCA GCGCTGGTAC	360
ACAGCCCCGA CTAGGGGACC TGCGGCGAAC TGTCGCCGCT CGGCACTTCG TGGTCTGCCA	420
CCAGCCGACC GCACTTACTG TTTTGATGGC TTTGCCGGCT GCCGTTTTGC CGCCGAGACT	480
GGTGTGGCTC TCTATTCTCT CCATGACTTG CAGCCGGCTG ATGTTGCCGA GGCGATGGCT	540
CGCCACGGCA TGACCCGCCT TTATGCAGCT TTCCACTTGC CTCCAGAGGT GCTCCTGCCT	600
CCTGGCACCT ACCGGACATC ATCCTACTTG CTGATCCACG ATGGTAAGCG CGCGGTTGTC	660
ACTTATGAGG GTGACACTAG CGCCGGTTAC AATCATGATG TTGCCACCCT CCGCACATGG	720
ATCAGGACAA CTAAGTTTGT GGGTGAACAC CCTTTGGTGA TCGAGCGGGT GCGGGGTATT	780
GGCTGTCACT TTGTGTTGTT GATCACTGCG GCCCCTGAGC CCTCCCCGAT GCCCTACGTT	840
CCTTACCCGC GTTCGACGGA GGTCTATGTC CGGTCTATCT TTGGGCCCGG CGGGTCCCCG	900

TCGCTGTTCC	CGACCGCTTG	TGCTGTCAAG	TCCACTTTTC	ACGCCGTCCC	CACGCACATC	960
TGGGACCGTC	TCATGCTCTT	TGGGGCCACC	CTCGACGACC	AGGCCTTTTG	CTGCTCCAGG	1020
CTTATGACGT	ACCTTCGTGG	CATTAGCTAT	AAGGTAAGTG	TGGGTGCCCT	GGTCGCTAAT	1080
GAAGGCTGGA	ATGCCACCGA	GGATGCGCTC	ACTGCAGTTA	TTACGGCGGC	TTACCTCACA	1140
ATATGTCATC	AGCGTTATTT	GCGGACCCAG	GCGATTTCTA	AGGGCATGCG	CCGGCTTGAG	1200
CTTGAACATG	CTCAGAAATT	TATTTACAGC	CTCTACAGCT	GGCTATTTGA	GAAGTCAGGT	1260
CGTGATTACA	TCCCAGGCCG	CCAGCTGCAG	TTCTACGCTC	AGTGCCGCCG	CTGGTTATCT	1320
GCCGGGTTCC	ATCTCGACCC	CCGCACCTTA	GTTTTTGATG	AGTCAGTGCC	TTGTAGCTGC	1380
CGAACCACCA	TCCGGCGGAT	CGCTGGAATA	TTTTGCTGTT	TTATGAAGTG	GCTCGGTCAG	1440
GAGTGTCTT	GTTTCCTCCA	GCCCCCGGAG	GGGCTGGCGG	GCGACCAAGG	TCATGACAAT	1500
GAGGCCTATG	AAGGCTCTGA	TGTTGATACT	GCTGAGCCTG	CCACCCTAGA	CATTACAGGC	1560
TCATACATCG	TGGATGGTCG	GTCTCTGCAA	ACTGTCTATC	AAGCTCTCGA	CCTGCCAGCT	1620
GACCTGGTAG	CTCGCGCAGC	CCGACTGTCT	GCTACAGTTA	CTGTTACTGA	AACCTCTGGC	1680
CGTCTGGATT	GCCAAACAAT	GATCGGCAAT	AAGACTTTTC	TCACTACCTT	TGTTGATGGG	1740
GCACGCCTTG	AGGTAAACGG	GCCTGAGCAG	CTTAACCTCT	CTTTTGACAG	CCAGCAGTGT	1800
AGTATGGCAG	CCGGCCCCGT	TTGCCTCACC	TATGCTGCCG	TAGATGGCGG	GCTGGAAGTT	1860
CATTTTTCCA	CCGCTGGCCT	CGAGAGCCGT	GTTGTTTTCC	CCCCTGGTAA	TGCCCCGACT	1920
GCCCCGCCGA	GTGAGGTCAC	CGCCTTCTGC	TCAGCTCTTT	ATAGGCACAA	CCGGCAGAGC	1980
CAGCGCCAGT	CGGTTATTGG	TAGTTTGTGG	CTGCACCCTG	AAGGTTTGCT	CGGCCTGTTC	2040
CCGCCCTTTT	CACCCGGGCA	TGAGTGGCGG	TCTGCTAACC	CATTTTGCGG	CGAGAGCACG	2100
CTCTACACCC	GCACTTGGTC	CACAATTACA	GACACACCCT	TAAGTGTCCG	GCTAATTTCC	2160
GGTCATTTGG	ATGCTGCTCC	CCACTCGGGG	GGGCCACCTG	CTACTGCCAC	AGGCCCTGCT	2220
GTAGGCTCGT	CTGACTCTCC	AGACCCTGAC	CCGCTACCTG	ATGTTACAGA	TGGCTCACGC	2280
CCCTCTGGGG	CCCGTCCGGC	TGGCCCCAAC	CCGAATGGCG	TTCCGCAGCG	CCGCTTACTA	2340
CACACCTACC	CTGACGGCGC	TAAGATCTAT	GTCGGCTCCA	TTTTCGAGTC	TGAGTGCACC	2400
TGGCTTGTCA	ACGCATCTAA	CGCCGGCCAC	CGCCCTGGTG	GCGGGCTTTG	TCATGCTTTT	2460
TTTCAGCGTT	ACCCTGATTC	GTTTGACGCC	ACCAAGTTTG	TGATGCGTGA	TGGTCTTGCC	2520
GCGTATACCC	TTACACCCCG	GCCGATCATT	CATGCGGTGG	CCCCGGACTA	TCGATTGGAA	2580
CATAACCCCA	AGAGGCTCGA	GGCTGCCTAC	CGCGAGACTT	GCGCCCGCCG	AGGCACTGCT	2640
GCCTATCCAC	TCTTAGGCGC	TGGCATTAC	CAGGTGCCTG	TTAGTTTGAG	TTTTGATGCC	2700
TGGGAGCGGA	ACCACCGCCC	GTTTGACGAG	CTTTACCTAA	CAGAGCTGGC	GGCTCGGTGG	2760

TTTGAATCCA ACCGCCCCGG TCAGCCCACG TTGAACATAA CTGAGGATAC CGCCCGTGCG	2820
GCCAACCTGG CCCTGGAGCT TGA CTCCGGG AGTGAAGTAG GCCGCGCATG TGCCGGGTGT	2880
AAAGTCGAGC CTGGCGTTGT GCGGTATCAG TTTACAGCCG GTGTCCCCGG CTCTGGCAAG	2940
TCAAAGTCCG TGCAACAGGC GGATGTGGAT GTTGTGTGTG TGCCCACTCG CGAGCTTCGG	3000
AACGCTTGGC GGGCCCGGG CTTTGCGGCA TTTACTCCGC AACTGCGGC CCGTGTCACT	3060
AGCGGCCGTA GGGTTGTCAT TGATGAGGCC CCTTCGCTCC CCCCACACTT GCTGCTTTTA	3120
CATATGCAGC GTGCTGCATC TGTGCACCTC CTTGGGGACC CGAATCAGAT CCCC GCCATA	3180
GATTTTGAGC ACACCGGTCT GATTCCAGCA ATACGGCCGG AGTTGGTCCC GACTTCATGG	3240
TGGCATGTCA CCCACCGTTG CCCTGCAGAT GTCTGTGAGT TAGTCCGTGG TGCTTACCCT	3300
AAAATCCAGA CTACAAGTAA GGTGCTCCGT TCCCTTTTCT GGGGAGAGCC AGCTGTCGGC	3360
CAGAAGCTAG TGTTACACA GGCTGCTAAG GCCGCGCACC CCGGATCTAT AACGGTCCAT	3420
GAGGCCCAGG GTGCCACTTT TACCACTACA ACTATAATTG CAACTGCAGA TGCCCGTGGC	3480
CTCATACAGT CCTCCCGGGC TCACGCTATA GTTGCTCTCA CTAGGCATAC TGAAAAATGT	3540
GTTATACTTG ACTCTCCCGG CCTGTTGCGT GAGGTGGGTA TCTCAGATGC CATTGTTAAT	3600
AATTTCTTCC TTTCGGGTGG CGAGGTTGGT CACCAGAGAC CATCGGTCAT TCCGCGAGGC	3660
AACCCGTACC GCAATGTTGA CGTGCTTGCG GCGTTTCCAC CTTATGCCA AATAAGCGCC	3720
TTCCATCAGC TTGCTGAGGA GCTGGGCCAC CGGCCGGCGC CGGTGGCGGC TGTGCTACCT	3780
CCCTGCCCTG AGCTTGAGCA GGGCCTTCTC TATCTGCCAC AGGAGCTAGC CTCCTGTGAC	3840
AGTGTTGTGA CATTTGAGCT AACTGACATT GTGCACTGCC GCATGGCGGC CCCTAGCCAA	3900
AGGAAAGCTG TTTTGTCCAC GCTGGTAGGC CGGTATGGCA GACGCACAAG GCTTTATGAT	3960
GCGGGTCACA CCGATGTCCG CGCCTCCCTT GCGCGCTTTA TTCCCACTCT CGGGCGGGTT	4020
ACTGCCACCA CCTGTGA ACTTTGAGCTT GTAGAGGCGA TGGTGAGAGAA GGGCCAAGAC	4080
GGTTCAGCCG TCCTCGAGTT GGATTTGTGC AGCCGAGATG TCTCCCGCAT AACCTTTTTTC	4140
CAGAAGGATT GTAACAAGTT CACGACCGGC GAGACAATTG CGCATGGCAA AGTCGGTCAG	4200
GGTATCTTCC GCTGGAGTAA GACGTTTTGT GCCCTGTTG GCCCTGGTT CCGTGCGATT	4260
GAGAAGGCTA TTCTATCCCT TTTACCACAA GCTGTGTTCT ACGGGGATGC TTATGACGAC	4320
TCAGTATTCT CTGCTGCCGT GGCTGGCGCC AGCCATGCCA TGGTGTTTGA AAATGATTTT	4380
TCTGAGTTTG ACTCGACTCA GAATAACTTT TCCCTAGGTC TTGAGTGCGC CATTATGGAA	4440
GAGTGTTGTA TGCCCCAGTG GCTTGTCAAG TTGTACCATG CCGTCCGGTC GGCGTGGATC	4500
CTGCAGGCCC CAAAAGAGTC TTTGAGAGGG TTCTGGAAGA AGCATTCTGG TGAGCCGGGC	4560
AGCTTGCTCT GGAATACGGT GTGGAACATG GCAATCATTG CCCATTGCTA TGAGTTCCGG	4620

GACCTCCAGG	TTGCCGCCTT	CAAGGGCGAC	GA CT CGGTCG	TCCTCTGTAG	TGAATACCGC	4680
CAGAGCCCAG	GCGCCGGTTC	GCTTATAGCA	GGCTGTGGTT	TGAAGTTGAA	GGCTGACTTC	4740
CGGCCGATTG	GGCTGTATGC	CGGGGTTGTC	GTCGCCCCGG	GGCTCGGGGC	CCTACCCGAT	4800
GTCGTTGAT	TCGCCGACG	GCTTTCGGAG	AAGAACTGGG	GGCCTGATCC	GGAGCGGGCA	4860
GAGCAGCTCC	GCCTCGCCGT	GCAGGATTTC	CTCCGTAGGT	TAACGAATGT	GGCCCAGATT	4920
TGTGTTGAGG	TGGTGTCTAG	AGTTTACGGG	GTTTCCCCGG	GTCTGGTTCA	TAACCTGATA	4980
GGCATGCTCC	AGACTATTGG	TGATGGTAAG	GCGCATTTTA	CAGAGTCTGT	TAAGCCTATA	5040
CTTGACCTTA	CACACTCAAT	TATGCACCGG	TCTGAATGAA	TAACATGTGG	TTTGCTGCGC	5100
CCATGGGTTC	GCCACCATGC	GCCCTAGGCC	TCTTTTGCTG	TTGTTCTCT	TGTTTCTGCC	5160
TATGTTGCCC	GCGCCACCGA	CCGGTCAGCC	GTCTGGCCGC	CGTCGTGGGC	GGCGCAGCGG	5220
CGGTACCGGC	GGTGGTTTCT	GGGGTGACCG	GGTTGATTCT	CAGCCCTTCG	CAATCCCCTA	5280
TATTCATCCA	ACCAACCCCT	TTGCCCCAGA	CGTTGCCGCT	GCGTCCGGGT	CTGGACCTCG	5340
CCTTCGCCAA	CCAGCCCGGC	CACTTGGCTC	CACTTGCGCA	GATCAGGCC	AGCGCCCCTC	5400
CGCTGCCTCC	CGTCGCCGAC	CTGCCACAGC	CGGGGCTGCG	GCGCTGACGG	CTGTGGCGCC	5460
TGCCCATGAC	ACCTCACCCG	TCCCGGACGT	TGATTCTCGC	GGTGCAATTC	TACGCCGCCA	5520
GTATAATTTG	TCTACTTCAC	CCCTGACATC	CTCTGTGGCC	TCTGGCACTA	ATTTAGTCCT	5580
GTATGCAGCC	CCCCTTAATC	CGCCTCTGCC	GCTGCAGGAC	GGTACTAATA	CTCACATTAT	5640
GGCCACAGAG	GCCTCCAATT	ATGCACAGTA	CCGGGTTGCC	CGCGCTACTA	TCCGTTACCG	5700
GCCCCTAGTG	CCTAATGCAG	TTGGAGGCTA	TGCTATATCC	ATTTCTTTCT	GGCCTCAAAC	5760
AACCACAACC	CCTACATCTG	TTGACATGAA	TTCCATTACT	TCCACTGATG	TCAGGATTCT	5820
TGTTCAACCT	GGCATAGCAT	CTGAATTGGT	CATCCCAAGC	GAGCGCCTTC	ACTACCGCAA	5880
TCAAGGTTGG	CGCTCGGTTG	AGACATCTGG	TGTTGCTGAG	GAGGAAGCCA	CCTCCGGTCT	5940
TGTCATGTTA	TGCATACATG	GCTCTCCAGT	TAACTCCTAT	ACCAATACCC	CTTATACCGG	6000
TGCCCTTGGC	T TACTGGACT	TTGCCTTAGA	GCTTGAGTTT	CGCAATCTCA	CCACCTGTAA	6060
CACCAATACA	CGTGTGTCCC	GTTACTCCAG	CACTGCTCGT	CACTCCGCCC	GAGGGGCCGA	6120
CGGGACTGCG	GAGCTGACCA	CAACTGCAGC	CACCAGGTTT	ATGAAAGATC	TCCACTTTAC	6180
CGGCCTTAAT	GGGGTAGGTG	AAGTCGGCCG	CGGGATAGCT	CTAACATTAC	TTAACCTTGC	6240
TGACACGCTC	CTCGGCGGGC	TCCCGACAGA	ATTAATTTTCG	TCGGCTGGCG	GGCAACTGTT	6300
TTATTCCCGC	CCGGTTGTCT	CAGCCAATGG	CGAGCCAACC	GTGAAGCTCT	ATACATCAGT	6360
GGAGAATGCT	CAGCAGGATA	AGGGTGTTCG	TATCCCCCAC	GATATCGATC	TTGGTGATTC	6420
GCGTGTGGTC	ATTCAGGATT	ATGACAACCA	GCATGAGCAG	GATCGGCCCA	CCCCGTGCGC	6480

TGCGCCATCT CGGCCTTTTT CTGTTCTCCG AGCAAATGAT GTACTTTGGC TGTCCCTCAC	6540
TGCAGCCGAG TATGACCACT CCACTTACCG GTCGTCAACT GGCCCGGTTT ATATCTCGGA	6600
CAGCGTGACT TTGGTGAATG TTGCGACTGG CGCGCAGGCC GTAGCCCGAT CGCTTGACTG	6660
GTCCAAAGTC ACCCTCGACG GCGGCCCCCT CCCGACTGTT GAGCAATATT CCAAGACATT	6720
CTTTGTGCTC CCCCTTCGTG GCAAGCTCTC CTTTTGGGAG GCCGGCACAA CAAAAGCAGG	6780
TTATCCTTAT AATTATAATA CTAAGCTAG TGACCAGATT CTGATTGAAA ATGCTGCCGG	6840
CCATCGGGTC GCCATTTCAA CCTATACCAC CAGGCTTGGG GCCGGTCCGG TCGCCATTTT	6900
TGCGGCCGCG GTTTTGGCTC CACGCTCCGC CCTGGCTCTG CTGGAGGATA CTTTTGATTA	6960
TCCGGGGCGG GCGCACACAT TTGATGACTT CTGCCCTGAA TGCCGCGCTT TAGGCCTCCA	7020
GGGTTGTGCT TTCCAGTCAA CTGTCGCTGA GCTCCAGCGC CTTAAAGTTA AGGTGGGTAA	7080
AACTCGGGAG TTGTAGTTTA TTTGGCTGTG CCCACCTACT TATATCTGCT GATTTCTTTT	7140
ATTTCTTTT TCTCGGTCCC GCGCTCCCTG A	7171

(2) INFORMATION FOR SEQ ID NO:11:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 1575 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: double

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: NO

(vi) ORIGINAL SOURCE:

(C) INDIVIDUAL ISOLATE: T: Mexican strain

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

GTTGCGTGAG GTGGGTATCT CAGATGCCAT TGTTAATAAT TTCTTCCTTT CGGGTGGCGA	60
GGTTGGTCAC CAGAGACCAT CGGTCATTCC GCGAGGCAAC CCTGACCGCA ATGTTGACGT	120
GCTTGCGGCG TTTCCACCTT CATGCCAAAT AAGCGCCTTC CATCAGCTTG CTGAGGAGCT	180
GGGCCACCGG CCGGCGCCGG TGGCGGCTGT GCTACCTCCC TGCCCTGAGC TTGAGCAGGG	240
CCTTCTCTAT CTGCCACAGG AGCTAGCCTC CTGTGACAGT GTTGTGACAT TTGAGCTAAC	300
TGACATTGTG CACTGCCGCA TGGCGGCCCC TAGCCAAAGG AAAGCTGTTT TGTCCACGCT	360
GGTAGGCCGG TATGGCAGAC GCACAAGGCT TTATGATGCG GGTACACCG ATGTCCGCGC	420
CTCCCTTGCG CGCTTTATTC CCACTCTCGG GCGGGTTACT GCCACCACCT GTGAACTCTT	480
TGAGCTTGTA GAGGCGATGG TGGAGAAGGG CCAAGACGGT TCAGCCGTCC TCGAGTTGGA	540

TTTGTGCAGC CGAGATGTCT CCCGCATAAC CTTTTTCCAG AAGGATTGTA ACAAGTTCAC 600
 GACCGGCGAG ACAATTGCGC ATGGCAAAGT CGGTCAGGGT ATCTTCCGCT GGAGTAAGAC 660
 CTTTTGTGCC CTGTTTGGCC CCTGGTTCCG TGCGATTGAG AAGGCTATTC TATCCCTTTT 720
 ACCACAAGCT GTGTTCTACG GGGATGCTTA TGACGACTCA GTATTCTCTG CTGCCGTGGC 780
 TGGCGCCAGC CATGCCATGG TGTGTTGAAA TGATTTTTCT GAGTTTGA CTGACTCAGAA 840
 TAACTTTTCC CTAGGTCTTG AGTGCGCCAT TATGGAAGAG TGTGGTATGC CCCAGTGGCT 900
 TGTCAGGTTG TACCATGCCG TCCGGTCGGC GTGGATCCTG CAGGCCCCAA AAGAGTCTTT 960
 GAGAGGGTTC TGAAGAAGC ATTCTGGTGA GCCGGGCAGG TTGCTCTGGA ATACGGTGTG 1020
 GAACATGGCA ATCATTGCCC ATTGCTATGA GTTCCGGGAC CTCCAGGTTG CCGCCTTCAA 1080
 GGGCGACGAC TCGGTCGTCC TCTGTAGTGA ATACCGCCAG AGCCAGGCG CCGGTTGCT 1140
 TATAGCAGGC TGTGGTTTGA AGTTGAAGGC TGACTTCCGG CCGATTGGGC TGTATGCCGG 1200
 GGTGTGTCGTC GCGGGGGGC TCGGGGCCCT ACCCGATGTC GTTCGATTCG CCGACGGCT 1260
 TTCGGAGAAG AACTGGGGGC CTGATCCGGA GCGGGCAGAG CAGCTCCGCC TCGCCGTGCA 1320
 GGATTTCTC CGTAGGTAA CGAATGTGGC CCAGATTGT GTTGAGGTGG TGTCTAGAGT 1380
 TTACGGGGT TCCCCGGGTC TGGTTCATAA CCTGATAGGC ATGCTCCAGA CTATTGGTGA 1440
 TGGTAAGGCG CATTTTACAG AGTCTGTAA GCCTATACTT GACCTTACAC ACTCAATTAT 1500
 GCACCGGTCT GAATGAATAA CATGTGGTTT GCTGCGCCCA TGGGTTCGCC ACCATGCGCC 1560
 CTAGGCCTCT TTTGC 1575

(2) INFORMATION FOR SEQ ID NO:12:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 874 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: double
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: NO

(vi) ORIGINAL SOURCE:

(C) INDIVIDUAL ISOLATE: Tashkent strain

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

CGGGCCCCGT ACAGGTCACA ACCTGTGAGT TGTACGAGCT AGTGGAGGCC ATGGTCGAGA 60
 AAGGCCAGGA TGGCTCCGCC GTCCTTGAGC TCGATCTCTG CAACCGTGAC GTGTCCAGGA 120
 TCACCTTTTT CCAGAAAGAT TGCAATAAGT TCACCACGGG AGAGACCATC GCGCATGGTA 180

AAGTGGGCCA GGGCATTTCG GCCTGGAGTA AGACCTTCTG TGCCCTTTTC GGCCCCTGGT 240
 TCCGTGCTAT TGAGAAGGCT ATTCTGGCCC TGCTCCCTCA GGGTGTGTTT TATGGGGATG 300
 CCTTTGATGA CACCGTCTTC TCGGCGCGTG TGGCCGCAGC AAAGGCGTCC ATGGTGTTTG 360
 AGAATGACTT TTCTGAGTTT GACTCCACCC AGAATAATTT TTCCCTGGGC CTAGAGTGTG 420
 CTATTATGGA GAAGTGTGGG ATGCCGAAGT GGCTCATCCG CTTGTACCAC CTTATAAGGT 480
 CTGCGTGGAT CCTGCAGGCC CCGAAGGAGT CCCTGCGAGG GTGTTGGAAG AAACACTCCG 540
 GTGAGCCCCG CACTCTTCTA TGAATACTG TCTGGAACAT GGCCGTTATC ACCCATTGTT 600
 ACGATTTC CGATTTCAG GTGGCTGCCT TTAAAGGTGA TGATTGATA GTGCTTTGCA 660
 GTGAGTACCG TCAGAGTCCA GGGGCTGCTG TCCTGATTGC TGGCTGTGGC TTAAAGCTGA 720
 AGGTGGGTTT CCGTCCGATT GGTGTGTATG CAGGTGTTGT GGTGACCCCC GGCCTTGGCG 780
 CGCTTCCGA CGTCGTGCGC TTGTCCGGCC GGCTTACTGA GAAGAATTGG GGCCCTGGCC 840
 CTGAGCGGGC GGAGCAGCTC CGCCTTGCTG TGCG 874

(2) INFORMATION FOR SEQ ID NO:13:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 449 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA to mRNA

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: NO

(vi) ORIGINAL SOURCE:

- (C) INDIVIDUAL ISOLATE: Clone 406.4-2 cDNA

(ix) FEATURE:

- (A) NAME/KEY: CDS
- (B) LOCATION: 2..100

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

C GCC AAC CAG CCC GGC CAC TTG GCT CCA CTT GGC GAG ATC AGG CCC 46
 Ala Asn Gln Pro Gly His Leu Ala Pro Leu Gly Glu Ile Arg Pro
 1 5 10 15
 AGC GCC CCT CCG CTG CCT CCC GTC GCC GAC CTG CCA CAG CCG GGG CTG 94
 Ser Ala Pro Pro Leu Pro Pro Val Ala Asp Leu Pro Gln Pro Gly Leu
 20 25 30
 CGG CGC TGACGGCTGT GGCGCCTGCC CATGACACCT CACCCGTCCC GGACGTTGAT 150
 Arg Arg
 TCTCGCGGTG CAATTCTACG CCGCCAGTAT AATTTGTCTA CTTACCCCT GACATCCTCT 210

GTGGCCTCTG GCACTAATTT AGTCCTGTAT GCAGCCCCC TTAATCCGCC TCTGCCGCTG 270
 CAGGACGGTA CTAATACTCA CATTATGGCC ACAGAGGCCT CCAATTATGC ACAGTACCGG 330
 GTTGCCCGCG CTACTATCCG TTACCGGCCC CTAGTGCCTA ATGCAGTTGG AGGCTATGCT 390
 ATATCCATTT CTTTCTGGCC TCAAACAACC ACAACCCCTA CATCTGTTGA CATGAATTC 449

(2) INFORMATION FOR SEQ ID NO:14:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 33 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

Ala Asn Gln Pro Gly His Leu Ala Pro Leu Gly Glu Ile Arg Pro Ser
 1 5 10 15
 Ala Pro Pro Leu Pro Pro Val Ala Asp Leu Pro Gln Pro Gly Leu Arg
 20 25 30
 Arg

(2) INFORMATION FOR SEQ ID NO:15:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 130 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA to mRNA

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: NO

(vi) ORIGINAL SOURCE:

- (C) INDIVIDUAL ISOLATE: Clone 406.3-2

(ix) FEATURE:

- (A) NAME/KEY: CDS
- (B) LOCATION: 5..130

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

GGAT ACT TTT GAT TAT CCG GGG CGG GCG CAC ACA TTT GAT GAC TTC TGC 49
 Thr Phe Asp Tyr Pro Gly Arg Ala His Thr Phe Asp Asp Phe Cys
 1 5 10 15
 CCT GAA TGC CGC GCT TTA GGC CTC CAG GGT TGT GCT TTC CAG TCA ACT 97
 Pro Glu Cys Arg Ala Leu Gly Leu Gln Gly Cys Ala Phe Gln Ser Thr
 20 25 30
 GTC GCT GAG CTC CAG CGC CTT AAA GTT AAG GTT 130

Val Ala Glu Leu Gln Arg Leu Lys Val Lys Val
35 40

(2) INFORMATION FOR SEQ ID NO:16:

(ii) MOLECULE TYPE: peptide
 (iii) HYPOTHETICAL: NO
 (iv) ANTI-SENSE: NO
 (vi) ORIGINAL SOURCE:
 (C) INDIVIDUAL ISOLATE: 406.4-2 epitope - Burma strain
 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

Ala	Asn	Pro	Pro	Asp	His	Ser	Ala	Pro	Leu	Gly	Val	Thr	Arg	Pro	Ser
1				5					10					15	
Ala	Pro	Pro	Leu	Pro	His	Val	Val	Asp	Leu	Pro	Gln	Leu	Gly	Pro	Arg
			20					25					30		

Arg

(2) INFORMATION FOR SEQ ID NO:19:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 42 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: unknown
 (ii) MOLECULE TYPE: peptide
 (iii) HYPOTHETICAL: NO
 (iv) ANTI-SENSE: NO
 (vi) ORIGINAL SOURCE:
 (C) INDIVIDUAL ISOLATE: 406.3-2 epitope - Mexican strain
 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

Thr	Phe	Asp	Tyr	Pro	Gly	Arg	Ala	His	Thr	Phe	Asp	Asp	Phe	Cys	Pro
1				5					10					15	
Glu	Cys	Arg	Ala	Leu	Gly	Leu	Gln	Gly	Cys	Ala	Phe	Gln	Ser	Thr	Val
			20					25					30		
Ala	Glu	Leu	Gln	Arg	Leu	Lys	Val	Lys	Val						
			35				40								

(2) INFORMATION FOR SEQ ID NO:20:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 42 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: unknown
 (ii) MOLECULE TYPE: peptide
 (iii) HYPOTHETICAL: NO
 (iv) ANTI-SENSE: NO

(vi) ORIGINAL SOURCE:

(C) INDIVIDUAL ISOLATE: 406.3-2 epitope - Burma strain

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

Thr Leu Asp Tyr Pro Ala Arg Ala His Thr Phe Asp Asp Phe Cys Pro
1 5 10 15

Glu Cys Arg Pro Leu Gly Leu Gln Gly Cys Ala Phe Gln Ser Thr Val
20 25 30

Ala Glu Leu Gln Arg Leu Lys Met Lys Val
35 40

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